

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Rec'd PCT/PTO 25 FEB 2005

PCT/JP2003/012385



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Applicant's or agent's file reference 03PCFP889	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/012385	International filing date (day/month/year) 29 September 2003 (29.09.2003)	Priority date (day/month/year) 30 September 2002 (30.09.2002)
International Patent Classification (IPC) or national classification and IPC H01M 8/06		
Applicant NEC CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 29 September 2003 (29.09.2003)	Date of completion of this report 28 June 2004 (28.06.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP2003/012385

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.  
 These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

See supplemental sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. \_\_\_\_\_

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## Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV.3

Claims 1-18 are characterized by the technical feature wherein a vapour or a mist is delivered from the fuel container to the fuel electrode, whereas claims 19-22 are characterized by the technical feature wherein the organic liquid fuel is converted into a vapor or a mist and is supplied to the fuel electrode; therefore, the technical characteristics of the inventions that are set forth in claims 1-18 and the inventions that are set forth in claims 19-22 are different.

Consequently, the present international application is considered to include two inventions, as set forth in claims 1-18 and in claims 19-22, respectively.

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	2-3, 7-18, 20	YES
	Claims	1, 4-6, 19, 21-22	NO
Inventive step (IS)	Claims	3, 12, 20	YES
	Claims	1-2, 4-11, 13-19, 21-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims		NO

### 2. Citations and explanations

- Document 1: JP 52-66937 A (Shin-Kobe Electric Machinery Co., Ltd.), 02 June 1977, (Family: none)
- Document 2: Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 161024/1975 (Laid-open No. 73426/1977), (Shin-Kobe Electric Machinery Co., Ltd.), 01 June 1977, (Family: none)
- Document 3: JP 58-82478 A (Matsushita Electric Industrial Co., Ltd.), 18 May 1983, (Family: none)
- Document 4: JP 51-4714 A (Nissan Motor Co., Ltd.), 16 January 1976, (Family: none)
- Document 5: JP 2000-512797 A (Siemens AG), 26 September 2000, & WO 97/50140 A1 & EP 907979 A1 & US 6509112 B1
- Document 6: JP 63-202861 A (Hitachi, Ltd.), 22 August 1988, (Family: none)
- Document 7: JP 2001-93551 A (Toshiba Corp.), 06 April 2001, & EP 1087455 A2 & US 6506513 B1

Claims 1, 4-6, 19 and 21 lack novelty and do not involve an inventive step in the light of documents 1 and 2 cited in the international search report.

Documents 1 and 2 disclose a feature wherein the fuel from a fuel tank that is equipped with a humidifier is supplied to the fuel electrode of a fuel cell in a spray form.

Claim 2 does not involve an inventive step in the light of documents 1 and 2 and documents 3 and 4 cited in the international search report.

The feature of controlling the amount of fuel that is supplied to a fuel cell according to the output of the fuel cell is well known, as disclosed in documents 3 and 4; therefore, it is considered to be easy for a person skilled in the art to configure so that in the inventions that are disclosed in documents 1 and 2, the amount of fuel that is sprayed is controlled according to the output of the fuel cell.

Claims 7-8 and 22 do not involve an inventive step in the light of documents 1 and 2, and document 5 cited in the international search report.

The feature wherein the liquid fuel that is supplied to a fuel cell is heated and is supplied in a gaseous form is well known, as disclosed in document 5; therefore, it is considered to be easy for a person skilled in the art to configure so that in the inventions that are disclosed in documents 1 and 2, the humidifier is used as a heating device and the liquid fuel that is supplied to the fuel cell is supplied in a gaseous form.

Claim 9 does not involve an inventive step in the light of documents 1 and 2, and document 6 cited in the international search report.

The inventions that are disclosed in documents 1 and 2 are provided with means for emitting the gas that is produced by the reaction, such as, for example, check valve (12) and the like. It is thought that a person skilled in the art could apply the feature that is disclosed in documents 1 and 2 to fuel cells wherein

carbon dioxide is generated as a reaction product gas, as appropriate, and the feature of using a separation membrane as the means for emitting the gas that is produced by the reaction is well known, as disclosed in document 6 (page 2, lower left column, lines 10-17); therefore, it is considered to be easy for a person skilled in the art to use a separation membrane as the means for emitting the gas that is produced by the reaction in an invention that is configured by applying the feature that is disclosed in documents 1 and 2 to a fuel cell wherein carbon dioxide is generated as a reaction product gas.

Claims 10 and 13-15 do not involve an inventive step in the light of documents 1 and 2.

It is thought that a person skilled in the art could conceive of applying the feature that is disclosed in documents 1 and 2 to a fuel cell for a portable device, as appropriate.

Claim 11 does not involve an inventive step in the light of documents 1-4.

The feature of controlling the amount of fuel that is supplied to a fuel cell according to the output of the fuel cell is well known, as disclosed in documents 3 and 4; therefore, it is considered to be easy for a person skilled in the art to configure so that in an invention that is configured by applying the feature that is disclosed in documents 1 and 2 to a fuel cell for a portable device, the amount of fuel that is sprayed is controlled according to the output of the fuel cell.

Claims 16-17 do not involve an inventive step in the light of documents 1, 2 and 5.

The feature wherein the liquid fuel that is supplied to a fuel cell is heated and is supplied in a gaseous form is well known, as disclosed in document 5; therefore, it is considered to be easy for a person skilled in the art

to configure so that in an invention that is configured by applying the feature that is disclosed in documents 1 and 2 to a fuel cell for a portable device, the humidifier is used as a heating device and the liquid fuel that is supplied to the fuel cell is supplied in a gaseous form.

Claim 18 does not involve an inventive step in the light of documents 1, 2 and 6.

The inventions that are disclosed in documents 1 and 2 are provided with means for emitting the gas that is produced by the reaction, such as, for example, check valve (12) and the like. It is thought that a person skilled in the art could apply the feature that is disclosed in documents 1 and 2 to a fuel cell for a portable device, wherein carbon dioxide is generated as a reaction product gas, as appropriate, and the feature of using a separation membrane as the means for emitting the gas that is produced by the reaction is well known, as disclosed in document 6 (page 2, lower left column, lines 10-17); therefore, it is considered to be easy for a person skilled in the art to use a separation membrane as the means for emitting the gas that is produced by the reaction in an invention that is configured by applying the feature that is disclosed in documents 1 and 2 to a fuel cell for a portable device, wherein carbon dioxide is generated as a reaction product gas.

Claims 19 and 22 lack novelty and do not involve an inventive step in the light of document 5 and document 7 cited in the international search report.

Document 5 discloses a feature wherein the liquid fuel that is supplied to a fuel cell is heated and is supplied in a gaseous form.

Claim 7 discloses a feature wherein the liquid fuel that is supplied to a fuel cell is gasified and is supplied to the fuel electrode.



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## VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 19 discloses a feature wherein "(a) the organic liquid fuel is supplied to the fuel electrode of a fuel cell...and (b) the aforementioned organic liquid fuel is converted into a vapor or a mist and is supplied to the aforementioned fuel electrode." However, this would mean that both the liquid organic fuel and the vapor or mist that is formed from the liquid organic fuel are supplied to the fuel electrode; therefore, this disclosure is contradictory.